

# **Industrial Pollution The IWRM Technology Challenge:**

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Society for Voluntary Action,  
Revitalization and Justice

## Abstract

Untreated industrial wastewater is a growing concern given the rapid industrialization of peri-urban areas in India. It impacts human health, agricultural production and livelihoods as well as eco-system sustainability. Svaraj has been working in Bangalore and Hyderabad, and with local partners, to work toward solutions on the growing issue of industrial wastewater management.

Hyderabad and Bangalore are two of the fastest growing cities in India. Although much of this growth is attributed to the service sector, they have both become key destinations for industrial activity. A large percentage of this industrial growth is being taken up by small and medium industries (SMIs), whose production costs constrain their capacity to priorities effective pollution treatment and ecological sustainability. If wastewater treatment is seen as a positive objective, with multiple socio-economic benefits, then it is imperative that the policy and process of pollution management be rethought and the costs to industry be understood while exploring opportunities for change.

Knowledge partnerships, skill transfer, technical assistance, and informal partnerships for holistic capacity building are essential components of this rethinking. Current regulatory frameworks focus on end-of-pipe treatment and compliance. However, policy and regulatory frameworks have to be fundamentally redesigned to create effective mechanisms for SMIs to participate in clean technology interventions. Industrial ecology – the understanding of material flows – is a very valuable analytical tool that can be used by policy makers for long-term planning and to identify areas for investment.

Svaraj's water programme, developed with, and funded by the Swedish International Development Agency (SIDA), is a community centred water resource management programme. Svaraj's focus is on providing and working towards sustainable solutions for natural resource management. This is done in a multi-disciplinary manner and in order to ensure economic prosperity alongside social justice, environmental sustainability and an appreciation for cultural values and customary practices. Often this requires challenging a growth paradigm that exacerbates inequalities, insecurities and environmental degradation. Through our program work, policy debates, and working papers, we aim to mobilise different sectors of the community to debate the issues that affect them.

SMIs are often the first point of production in a long supply chain, both within India and internationally. The SMIs in Hyderabad, Andhra Pradesh, are responsible for the production of over 1000 bulk drugs and formulations and export 41 per cent of their production to international markets, at a total cost of Rs 14 crores (\$ 3.5 mn). This paper will highlight the

**Table 1 – Calculating the value of SMIs**

SMIs provide local employment and add to India's competitive advantage in industrial production

There are over 4 million SMIs in India

In 2005 SMIs contributed to 34% of India's total net exports

The average annual industrial growth rate has been 7 per cent

The south Indian states contribute to over 22 % of India's total GDP in industry

Industrial policies in Karnataka and Andhra Pradesh commit to a growth rate of 12% and 15% respectively.

growing industrial activity taking place in two peri-urban areas; Doddaballapur, Karnataka and Patancheru, Andhra Pradesh.

1 For more information, please see Economic and Political Weekly (2002) Murty and Prasad; [www.greenpeace.org](http://www.greenpeace.org); <http://www.peopleandplanet.net>.

2 All information pertaining to PIA obtained in 2005

3 All information taken from interviews conducted with PETL employees and industry representatives

### **Case Study 1 - Business Unusual; Pollution Control and Patencheru Industrial Area**

Much of Andhra Pradesh's (AP) industrial activity takes place in its 272 industrial clusters. AP has over 3000 large and medium scale industries, with 20,000 small-scale industries. Patencheru Industrial Area (PIA) has approximately 276 units involved in bulk drug processing and electroplating activities and is located 15km outside of Hyderabad city, the capital of AP.

The Government of Andhra Pradesh introduced benefits for industrial investment in the 1970s. Industrial Zones such as PIA were created, and attractive financial and administrative incentives were provided for industries. When they were first built these individual industrial units (IUs) had no specific pollution control guidelines to follow for establishment and operation. It wasn't long before untreated, hazardous effluents were being released onto the land surrounding the estates.

The high chemical content of untreated effluent from PIA has degraded the productive capabilities of the nearby agricultural land. It has been estimated that in excess of 7000 acres and 50,000 people have been affected by the untreated effluent discharged from IUs in Patencheru Industrial Area alone. Studies have shown an exponential increase in the amount spent, per affected family, on medical costs and hospitalization for water related conditions ranging from skin allergies, loss of vision, respiratory diseases to cancer .

Patencheru EnviroTech Limited was opened in 1994, and is a privately owned and operated Common Effluent Treatment Plant (CETP). The monthly running cost of PETL is Rs 4.5 million . It has a maximum capacity of 7.5 million liters a day of effluent, which is received from its member industries. PETL currently charges Rs 5000 per tanker for effluent treatment . In 2005 PETL was receiving approximately 160 tankers of effluent for treatment per day. Each tanker contains, on average, 5,000 liters of effluent. This is a total of 800,000 liters per day.

### **Case Study 2 - Doddaballapur, Karnataka – Growing Problems**

Doddaballapur town has a total of 31 wards, and a population of 75,000. It has been subject to rapid urbanisation and socio-economic transition over the past 10-15 years. Although Doddaballapur has been a pre-dominantly agricultural society, in recent times livelihood patterns have shifted to industry, labour and trade. The textile industry is a major source of employment and there are over 50,000 powerlooms, and 80 dyeing units in the town as part of the area's cottage industry. There are an additional 95 registered medium and large industries of which 44 per cent are considered to be 'highly polluting'. These 95 industries discharge a total of 400,000 litres/day of wastewater. This is in addition to the 243 tons of hazardous waste and 16712 tons of non-bio degradable waste that is produced each year . Industries in the area get their required water from borewells, drilled often in agricultural land or from private tankers at a cost of Rs. 200/ 6000 litres. Water from tankers, and from borewells are using the same source; groundwater. Both tankers and borewells are cheap sources of procuring water. The Government of Karnataka does not charge industries a premium for borewells drilled in agricultural land. Industries need only bear the one time cost of drilling and installation to enjoy an unlimited and unregulated supply of groundwater.

Doddaballapur suffers from lack of freshwater and is listed as an over-exploited area according to the Karnataka Ground Water Board. The rate of groundwater extraction has increased almost 200 per cent since 1992. Nearly 100% of its inhabitants rely on private suppliers for drinking water at the rate of Rs. 300/10 kilolitres . Many of these inhabitants work as labor for the nearby industries. The cost of water is prohibitive for these daily wage earners. The Doddaballapur Municipal Corporation (DMC), which is mandated to provide water for its citizens, also relies on bore well water. Today the DMC bore wells supply brackish, non-potable water to residents. Unregulated groundwater extraction and effluent mismanagement have negatively impacted the local agricultural production as well and the health of the town's inhabitants.

Despite the current status of groundwater utilization and water scarcity, the Doddaballapur area is set to undergo further industrialization. An apparel park with approximately 150 SMIs is being developed, as well as associated industries being built to support the upcoming inter-

4 Karnataka State Pollution Control Board (2006) 'Doddaballapur Local Area Environmental Committee Report'  
5 1 kilolitre = 1000 litres

national airport. Water demand is estimated to increase by a further 500 per cent in the next 10 years

### **Pollution Control**

The Water (Prevention and Control of Pollution) Act of 1974 states that a Central Pollution Control Board (CPCB) will serve as an advisory body to the Central Government, as well as the State Pollution Control Boards (SPCBs), on water pollution issues. The CPCB acts as a coordinating body for activities, trainings and monitoring of SPCBs. Although the CPCB sets the national standards for pollution control, it is the role of the SPCB to ensure compliance to these prescribed standards, and to implement local level inspections of industry, evaluations of potential pollution causing activities, and to take action against violators.

The SPCB requires a comprehensive system of operational 'consents' for any new industrial unit, as well as monitoring procedures for existing industries. The SPCB has the authority to close down industries that continue to violate policy norms. Additionally, under the stipulations of the modified 1988 provisions, all information relevant to the 'public interest' should be made readily available by the SPCB to citizens. The Water (Prevention and Control of Pollution) Cess Act of 1977 provides limited incentives for industries to set up on-site effluent treatment plants despite legislative obligations on the characteristics of wastewater output.

In addition to the Water (Prevention and Control of Pollution) Cess Act of 1977, there are numerous other policies in place that can, if practiced, act as checking mechanisms for industrial operations and management. The reality of practice is that multiple government departments are involved in the same geographical areas with little communication and information sharing. In Doddaballapur water is the mandate of Rural Development and Panchayat Raj Department, Irrigation Department, and Karnataka Urban Infrastructure Development Finance Corporation (KUIDFC).

There is a need for a framework of cooperation

between implementing agencies in the area of water and environment. It is evidently difficult for a single regulatory body, with multiple priorities, to give equal attention to all areas when independent assessment is required. Given the multiple areas that are impacted with the sanctioning and development of industrial activity, it is important that there be a framework of oversight that goes beyond just the Pollution Control Board.

Similar concerns have given rise to the Water Framework Directive (WFD) in Europe. The WFD is a comprehensive piece of legislation that will act as a catalyst for the sustainable management of water for the contracting member states of the European Union. Industrial activity is assessed through a variety of different criteria before being given clearance. The process of area-specific priorities is established through extensive public participation. Although there will be substantial operational barriers for this model to be replicated in India, it is the principle of departmental collaboration that needs to be taken up.

International efforts at regulating industry and increasing transparency in product processes will also impact the Indian industrial sector, especially the bulk drug sector in Andhra Pradesh. Registration, Evaluation, Authorization, and Restriction of Chemicals (REACH) is an effort by the European Union to streamline the legislative and regulatory framework for industries. It aims to improve the transparency of information about chemicals being used in industrial process. This in turn will promote environmentally and socially sustainable practices. Significantly, it also has provisions for industries that import products.

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All manufacturers and importers of chemicals must identify and manage risks linked to the substances they manufacture and market. For substances produced or imported

6 REACH entered into force on June 1, 2007 and registration will begin in June 2008

7 Available at [http://reach.jrc.it/about\\_reach\\_en.htm](http://reach.jrc.it/about_reach_en.htm)

in quantities of 1 tonne or more per year per company, manufacturers and importers need to demonstrate that they have appropriately done so by means of a registration dossier, which shall be submitted to the Agency.

If India aims to encourage the growth of the SMI sector, it will be imperative that SMIs are ably assisted in understanding and adapting to the international regulatory regimes.

A clear incentive has to be provided for industries to take up cleaner production strategies. State governments need to understand how to balance social costs and environmental impacts with economic growth. International directive principles might be the catalyst in such a movement, but for such initiatives to be sustainable they have to be supported by frameworks for implementation that are suitable to local conditions and political realities. Political will is a critical component in the process and the provision of adequate positive incentives for industries. It is no use providing a fund for technology partnerships if basic site up gradation is not being done, and subsidized first

### **The Way Forward - Reducing the polluting intensity of production**

International Directive Principles are causing changes for larger industries to come in line regarding pollution management techniques. The National Clean Production Center (NCPC), housed out of the National Productivity Council in New Delhi was set up in 2002. Its mandate is 'to demonstrate industry progress in the area of Cleaner Production and Energy Efficiency (CP-EE), and to share leading edge and best practices amongst [their] stakeholders.' The centre has worked with over 100 industries in India to institute CP-EE solutions. Key to the centre's strategy is the way in which such cleaner production can actually result in higher profits and savings.

The NCPC is a for profit service provider. SMIs require incentives and capacity for effective wastewater management. This can come as a subsidy directly from state governments, as well as in the form of partnerships with existing technical organisations.

Although clean technologies have been an attractive option for industrial clean-up, it is important to consider other more viable options for sustainable production for SMIs in countries like India. Given the scale at which industrialisation is progressing; a systems approach can provide a more macro-understanding of areas for development. Industrial ecology can offer an attractive framework for thinking about industrial strategy and development.

Industrial Ecology (IE) is the study of material and energy flows in industrial and consumer activities. This incorporates the effects of flows on the environment and the knock-on socio-economic and political repercussions of resource use. Taking the case of Doddaballapur Industrial Estate, we then look at industrial activity as a whole<sup>9</sup>

The material flow analysis can be compared with an economic valuation of input costs against output. Part of the valuation will incorporate the existing environment in which production takes place; namely groundwater over-extraction and declining agricultural production. With this holistic cost-benefit analysis the State is in a better position to decide whether a town like Doddaballapur is an effective and suitable place for further industrialization.

Industrial ecology is a new science in India but has already being utilized by State Pollution Control Boards as a monitoring tool. It becomes most effective when it is used as a planning tool. Industrial ecology is a useful tool for policy planners, industrialists, as well as research agencies working towards ground level change. It would be short-sighted to expect long-term beneficial results from clean technology options for SMIs if a larger policy framework is not established such that returns and incentives are clear both for industries as well as the environment and the larger society.

### **SVARAJ**

Svaraj has been working in both Doddaballapur and Patencheru for the last three years. Our work is with communities in raising awareness of industrial pollution and to facilitate successful engagement between community and government bodies in order to obtain adequate compensation for health and livelihood

<sup>8</sup> National Productivity Council, available at [www.npcindia.org](http://www.npcindia.org)

<sup>9</sup> Please refer to Annexure 1 for Materials Flow analysis for Doddaballapur Industrial Estate

losses due to ineffective wastewater treatment and disposal. Svaraj is working in Patancheru with its program partner – Gamana, and in Doddaballapur with its own field team.

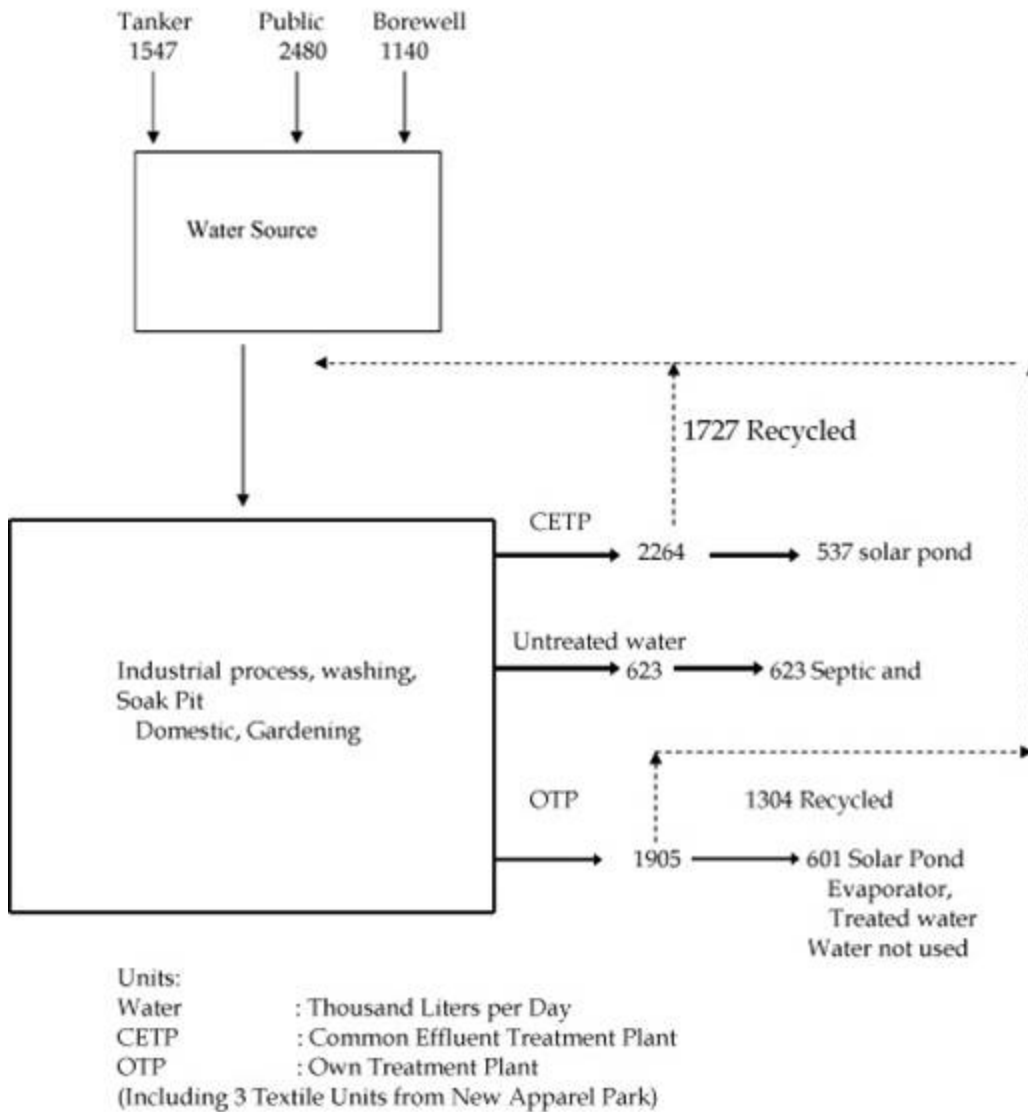
In December 2006, Svaraj hosted a multi-stakeholder dialogue in both Bangalore and Hyderabad to better understand the emerging challenges for clean technology and pollution treatment in India as well as the costs and benefits of implementing clean technologies for SMIs. The multi –stakeholder dialogue was in partnership between with the Confederation of Indian Industry, the Andhra Pradesh Pollution Control Board, and the Andhra Pradesh Bulk Drug Manufacturing Association as well as with members of affected communities .

The side-event organised for August 12, 2007 during the Stockholm World Water Week is part of Svaraj’s continued commitment to working towards sustainable solutions for industrial waste-water management and treatment. The roundtable discussion will bring together key decision makers and provide a platform for discussion on the feasibility of technology for SMIs in India. It will also focus on the steps that need to be taken to provide an enabling environment for SMIs to willingly take up such options.

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# Annexure

## Material Flow -Water- Doddaballapur- Industrial area



Source: Resource Optimization Initiative for more information log on to [www.roi-online.org](http://www.roi-online.org)



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